

PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Clean Coal Power
Initiative (CCPI)

07/2003



GILBERTON COAL-TO-CLEAN FUELS AND POWER PROJECT

CONTACT

U.S. Department of Energy
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PARTICIPANT

WMPI PTY., LLC
Gilberton, PA

LOCATION

Gilberton
Schuylkill County, PA

TOTAL ESTIMATED COST

\$612,000,000

COST SHARE

DOE	\$100,000,000
Participant	\$512,000,000

Project Description

WMPI PTY., LLC of Gilberton, Pennsylvania has assembled a leading technology and engineering team to design, engineer, construct, and demonstrate the first clean coal power facility in the United States using coal waste gasification as the basis for clean power, thermal energy and clean liquid fuels production. In addition to WMPI, the team includes Nexant, Inc., an affiliate of Bechtel Corporation; Shell Global Solutions U.S., an international energy company with a major presence in coal gasification technology; Uhde, a global engineering company and authorized Shell gasification technology supplier and contractor; and SASOL Technology Ltd., a world leader in Fischer-Tropsch (FT) Liquefaction technology.

The Gilberton plant will gasify coal wastes to produce a synthesis gas consisting of hydrogen and carbon monoxide. As with other processes employing high-pressure "oxygen-blown" gasifiers, this system offers potential for sequestering CO₂. Electric power and steam will be produced, and a portion of the synthesis gas will be converted into synthetic hydrocarbon liquids via a catalytic chemical process known as FT synthesis. The project concept is represented by the vision of a coal-to-energy plant of the future depicted on the following page.

Benefits

A primary benefit of this project is that it applies clean coal technology to address a long-standing environmental reclamation issue associated with the mining and production of coal. This project offers a unique integration of several key technologies to, for the first time, convert 4,700 tons/day of coal waste materials (referred to as anthracite culm in this case) into 41 MWe of clean electric power and over 5,000 barrels per day of ultra-clean transportation fuels. This project will process about 1.0 million tons per year of coal waste materials from the Gilberton site. It has been estimated that from past coal mining operations, about 200-300 million tons of this material can be found across Pennsylvania alone. A similar amount is present in Illinois. If successful, this technology could be applied in many regions of the country enabling reclamation of lands where coal wastes are currently stockpiled and significantly reduce waste disposal activities from operating coal mines. The transportation fuels produced will be in the form of ultra-clean high-cetane diesel fuel from the FT process and contain no sulfur or aromatics. The FT naphtha



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DURATION

72 months

ADDITIONAL TEAM MEMBERS

Nexant, Inc.

San Francisco, CA

Shell Global Solutions B.V., U.S.

Houston TX

Uhde GmbH

Dortmund, Germany

SASOL Technology Ltd.

Johannesburg, Republic of South Africa

CUSTOMER SERVICE

800-553-7681

WEBSITE

www.netl.doe.gov

can be upgraded to clean-burning reformulated gasoline. FT naphtha is also an excellent feedstock for steam cracking for olefin production, or as onboard reforming feed for fuelcell powered vehicles. The proposed process scheme is very flexible. It can use coal, coal wastes, petroleum coke, and bio-mass alone, or as a blended feedstock to make synthesis gas that can be converted into a variety of beneficial products such as electricity, process heat, transportation fuels and other chemical feedstocks. The combination of the Shell gasifier and the use of the Rectisol™ process will remove contaminants from the plant's effluent to very low levels. In fact, this stream will be concentrated in carbon dioxide and offers an opportunity for carbon management options beyond this demonstration project. The gross plant efficiency is estimated to be about 45% based on the total energy input and considering the energy value of all of the plant's products. The project will bring this country one step closer to energy independence by demonstrating the ability to economically convert domestic waste coal and low-value energy resources into high-value products in an environmentally sound manner. If successful, this project is of sufficient scale to reduce technical, business and financial risks clearing the way for subsequent applications.

